



(Following Paper ID and Roll No. to be filled in your Answer Book)

PAPER ID : 9914

Roll No.

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B. Tech.

(SEM. I) EXAMINATION, 2007-08

CHEMISTRY

Time : 3 Hours]

[Total Marks : 100

1 Attempt any **two** parts of the following : 10×2

- (a) Name and draw the three common crystal structures adopted by metals.
- (b) Describe the structures of interstitial and substitutional alloys and outline the factors determining which is formed.
- (c) What is Bragg's law ? How do you calculate the density of unit cell?

2 Attempt any **four** of the following : 5×4

- (a) Write down the absorption positions of common functional groups found in organic compounds.
- (b) What is 'SHIELDING' and 'DESHIELDING'.
- (c) Enumerate the differences between thermoplastics and thermosetting plastics.
- (d) Give the preparation of BUNA-S and BUNA-N.



(e) How do you prepare the following polymers :

(i) Bakelite

(ii) Perspex.

(f) Give a brief account of the applications of conducting polymers.

3 Attempt any **four** parts :

5×4

(a) Explain the order and stability of primary, secondary and tertiary carbocations.

(b) What do you understand by 'Racemization of configuration' ? Explain with the help of a reaction.

(c) Write down the mechanism of the following reactions :

(i) Cannizzaro reaction

(ii) Hofmann rearrangement.

(d) What do you understand by conformation and conformation analysis ? Draw the various conformations of n-butane and explain their order of stability using energy profile diagram.

(e) What is 'Optical activity'? How do you specify a particular configuration as R and S ?

(f) Describe the preparation and properties of carbanions.

4 Attempt any **four** parts :

5×4

(a) What do you understand by the rate equation and the order of a reaction ?

(b) Derive the Rate Expression for second-order reactions, when the reactants are different.

(c) Discuss the effect of temperature on reaction rates.

(d) Define the following terms :

(i) Phase

(ii) Components

(iii) Degree of Freedom.

(e) What is a Galvanic cell ? Describe at least two common types of reversible electrodes.

(f) Describe in brief the electrochemical theory of corrosion.

5 Attempt any **four** parts :

5×4

(a) What is potable water? What are its chief requirements?

(b) Give a brief account of the treatment of boiler feed water by Calgon process.

(c) What is the effect of ozone depletion ? How does it occur?

(d) Classify the air pollutants. What are their sources? How do they affect man and environment?

(e) What is photochemical smog ? Discuss the mechanism of photochemical smog formation with relevant reactions.

(f) Write a note on 'Biomass and Biogas'.